

## ABSTRACT

A multi-protocol, multi-stage, real-time frame classifier is disclosed. A preliminary multi-protocol frame composition analyzer is provided for performing preliminary multi-protocol frame classification for incoming frames. A parsing instruction generator is provided for processing at least the incoming frame and the preliminary multi-protocol frame classification to provide parsing instructions. A multi-stage parsing engine provides multi-stage parsing of the incoming frame according to the parsing instructions to generate search results presenting information about the incoming frame. An advanced level of data extraction is provided across various frame protocols without imposing a performance penalty. Longest prefix match searches and/or direct lookup searches are supported. Moreover, conditional extractions, instruction branching, multi-stage processing are all performed in real time.